THE PROCEEDINGS

of

The Institute of Radio Engineers

INDEX

1909-1936
INCLUSIVE

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Institute of Radio Engineers

The Institute of Radio Engineers was formed in 1912 through the amalgamation of the Society of Wireless Telegraph Engineers and the Wireless Institute. Its headquarters were established in New York City and the membership has grown from less than fifty members at the start to several thousand.

The Institute functions solely to advance the theory and practice of radio and allied branches of engineering and of the related arts and sciences, their application to human needs, and the maintenance of a high professional standing among its members. Among the methods of accomplishing this is the publication of papers, discussions, and communications of interest to the membership.

The PROCEEDINGS is the official publication of the Institute and in it are published all of the papers, discussions, and communications received from the membership which are accepted for publication by the Board of Editors. Copies are sent without charge to all members of the Institute. The subscription price to nonmembers is $10.00 per year with an additional charge for postage where such is necessary.

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Eight issues of the Proceedings of the Wireless Institute were published during 1909. Their contents are listed in this index.

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Standards Report

The first report of the Committee on Standardization (1913) will be found at the back of Volume 1. Subsequent revised reports dated 1915, 1922, 1926, 1928, 1931, and 1933 were published as separate pamphlets. Copies of the 1933 Report are available from the Institute at $1.00 per copy.

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The Institute of Radio Engineers

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Institute. The Institute of Radio Engineers was formed in 1912 through the amalgamation of the Society of Wireless Telegraph Engineers and the Wireless Institute. Its headquarters were established in New York City and the membership has grown from less than fifty members at the start to several thousand.

Aims and Objects. The Institute functions solely to advance the theory and practice of radio and allied branches of engineering and of the related arts and sciences, their application to human needs, and the maintenance of a high professional standing among its members. Among the methods of accomplishing this is the publication of papers, discussions, and communications of interest to the membership.

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Pennsylvania	Philadelphia, Philco Radio & Television Corp.	Grimditch, W. H.
England	Cambridge, 22 Hartington Grove	Carter, C. J.

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	Emporium, Hotel Warner	Ottemiller, W. H
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	Emporium, 4 E. 6th St.	Kahl, M. I.
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	Emporium, 520 Vine St.	Wilson, M. D.
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	St. Marys, 252 N. St. Marys St.	Hoffman, R. R.

For Election to the Member Grade

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For Election to the Associate Grade

Alabama	Andalusia, Box 445	Everage, A. E.
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	San Francisco, 667-9th Ave.	Hollingsworth, L. M.
	San Pedro, USS Tennessee	Smith, A. J.
Connecticut	Bridgeport, General Electric Co., Bldg. 33E	Chun, M. E.
District of Columbia	Bellevue, Washington, Naval Research Lab.	Fifer, W. H.
	Bellevue, Washington, Radio Materiel School	Rost, E. J.
Illinois	Urbana, 1011 E. Water St.	Phillips, W. E.
Indiana	Fort Wayne, Capehart Corp.	Baxter, J. M.
Iowa	Dubuque, 1595 Atlantic St.	Lutes, R. K.
Kentucky	Louisville, 936 Audubon Park	LaVielle, W. R. R.
	Louisville, 2601 Garland Ave.	Rubin, H. B.
Massachusetts	Springfield, 117 Northampton Ave.	Weeks, G. E.
Michigan	Milford, General Motors Proving Ground	Huber, P.
Missouri	Springfield, 600 E. Page St.	Robinson, C. F.
New Jersey	East Orange, 106 N. Walnut St.	Pritchard, E. M.
	Harrison, RCA Mfg. Co., Inc., RCA Radiotron Div.	Waller, L. C.
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Belgium	Brussels 3, 8 Rue Van Droogen Broeck	Van Hecke, A.
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Canada	Hamilton, Ont., 35 Catherine St., S.	Pickett, J. H.
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India	Bangalore, Indian Inst. of Science, Hebbal P.O.	Patel, I. L.
	Bombay, 775 Parsi Colony, Dadar	Dharap, P. W.
Japan	Kagoshima, Kagoshima Hosokyoku Tempozancho	Sakamoto, R.
Kenya	Nairobi, P.O. Box 1093	Pegrume, S. A.
Latvia	Riga, c/o VEF, Brivibas Gatve 19	Ziemelis, V.
South Africa	Germiston, c/o South African Airways, Rand Airport	Breeze-Carr, A.
Territory of Hawaii	Kahuku, Oahu, c/o R.C.A. Communications, Inc.	Gray, G. P.
Venezuela	Caripito, Standard Oil Co. of Venezuela	Johnson, D. W., Jr.
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Indiana	Indianapolis, 605 N. Sherman Dr.	Thompson, M. E.
	Valparaiso, 252 Locust St.	Denton, F. L.
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England	Forest Hill, London S.E.23, 74 Brockley Rise	Davie, O. H.

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Iowa	Ames, 238 Hyland Ave.	Sproul, P. T.
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Massachusetts	Boston, 330 Bay State Rd.	Hazeltine, A. V.
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	Cambridge, 51 Oxford St.	Graef, R. L.
	Cambridge, Box 566, M.I.T. Dormitories	Smith, C. R.
	Cambridge, M.I.T. Dormitories	Wiggin, J. F.
	Cambridge, 8 Dana St.	Wood, D. O.
Nebraska	Holdrege, 915 Sherman St.	Hjelmfelt, R. H.
New Jersey	Allendale, 754 Franklin Turnpike	Phair, R. S.
	Hoboken, 532 River St.	Buchanan, R. L.
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INCORRECT ADDRESSES

Listed below are the names and the last-known addresses of one hundred and twenty-eight members of the Institute whose correct addresses are unknown. It will be appreciated if anyone having information concerning the present addresses of any of the persons listed will communicate with the Secretary of the Institute.

Allston, William F.	c/o Tropical Radio Telephone Company, Box 488, Hialeah, Fla.
Andrus, Roy E.	5855 Washington Ave., Ashtabula, Ohio.
Bailey, Homer M.	S.S. *Prusa*, Houston, Tex.
Balsley, James R.	Box 214, R. 1, La Canada, Calif.
Barnette, Allen F.	c/o William Rose, 314 W. 94th St., Los Angeles, Calif.
Bennett, Robert P.	2116 P St., N.W., Apt. 25, Washington, D. C.
Berge, Sigfred F.	4703-12th Ave., N.E., Seattle, Wash.
Blessing, G. W.	Gregory W. Blessing and Company, 106 Jarvis St., Toronto, Ont., Canada
Booth, Albert E.	11 Buckingham Mount, Headingley, Leeds 6, Yorkshire, England.
Bowers, Lindsay G.	15 Tennyson St., Dominion Road, Auckland, New Zealand.
Brainson, William	596 Edgecombe Ave., New York, N. Y.
Brandis, Louis J.	Radio Service Laboratory, Box 202, Quantico, Va.
Brewster, Grant	c/o T. A. Long, Box 50–51 Cristobal, Canal Zone.
Bullock, Mark W.	505 Huntington Ave., Council Bluffs, Iowa.
Burnside, D. G.	204 Glenwood Ave., East Orange. N. J.
Cameron, James R.	668 N.E. 61st St., Miami, Fla.
Coblentz, Orhan R.	1420-39th Ave., North, Seattle, Wash.
Conviser, Harry	5908-21st Ave., Brooklyn, N. Y.
Cooke, Charles G.	2953 Colerain Ave., Cincinnati, Ohio.
Cumming, L. Gordon	Shore Acres, Cape Elizabeth, Maine.
Cuthbert, George	199 Lonsmount Dr., Toronto, Ont., Canada.
Dalton, Stuart P.	8749 South Hobart Blvd., Los Angeles, Calif.
Davis, Harold	536½ N. San Vincente Blvd., West Hollywood, Calif.
Doolittle, Franklin M.	147 Robin Rd., West Hartford, Conn.
Dreyer, Harry W.	54 Windsor Pl., Oceanside, N. Y.
Duncan, James E.	31 Sussex Court, Corner Sussex and Huron Sts., Toronto, Ont., Canada
Duncan, R. L.	1945 E. Eighth St., Brooklyn, N. Y.
Dutton, Laurence E.	Box 102, Miami Beach, Fla.
Eltgroth, George V.	1823 N. Lawndale Ave., Chicago, Ill.
Evans, John W.	Radio Department, T. Eaton Company, Halifax, N. S., Canada.
Faust, Fred D.	Radio Service, 928 W. Eighth Pl., Los Angeles, Calif.
Fay, Richard H.	315 E. 77th St., New York, N. Y.
Fisher, Theodore	S.S. *Polarine*, Standard Oil Company of Louisiana, Baton Rouge, La.
Flickinger, J. H.	Flix Sound Systems, 1739 W. Pico St., Los Angeles, Calif.
Galloway, C. Hadfield	Flat 1, No. 9 Clydesdale Mansions, Clydesdale Rd., London W.11 England.
Gowan, Hubert S.	62 St. George St., Kitchener, Ont., Canada
Grimes, H. B.	269 Waterloo St., Winnipeg, Man., Canada.
Grumman, F. W.	20 Irving Pl., New York, N. Y.
Haines, Donald G.	200 Franklin St., Bloomfield, N. J.
Hajim, Jack	518 N. Seventh St., Phoenix, Ariz.
Hansen, Leland S.	5525 Agatite Ave., Chicago, Ill.
Hantzsch, Ralph E.	10 Alvin Ter., Springfield, N. J.
Haralson, Bryan J.	3745 S. Grand Ave., Los Angeles, Calif.
Harmon, Walter S.	205 N. Berendo St., Los Angeles, Calif.
Hastings, T. Mitchell	Little's Point, Swampscott, Mass.
Hathaway, John F.	4019 N. Kilpatrick Ave., Chicago, Ill.
Hecht, R. H.	c/o Electric Research Products, Inc., Telephone Bldg., 1010 Pine St. St. Louis, Mo.
Herdman, William P.	9 Waller Ave., Ossining, N. Y.
Hillebrand, W. A.	1400 Hawthorne Ave., Berkeley, Calif.
Hoffman, Ross B.	Les Laboratoires L.M.Y., 46, Avenue de Breteuil, Paris, France.
Holaday, Donald F.	Radio Station KVSO, Ardmore, Okla.
Isserstedt, Siegfried G.	1590 Bathurst St., Toronto, Ont., Canada.
Jackson, Paul F.	The Jackson Electrical Instrument Company, 432 Kiser, Dayton, Ohio.
Jackson, Wilbur M.	Box 125, Faculty Exchange, College Station, Tex.
Jeang, Bao-Tzeng	c/o China Institute in America, 119 W. 57th St., New York, N. Y.
Jefferson, Sidney	52 Cambridge St., London, W.2, England.
Jensen, Jens O.	534 Anastasia Ave., Coral Gables, Fla.
Judd, Frederick V. H.	14 Bruce Rd., Upper Montclair, N. J.

Keeling, Charles H.	60, Hilltop Rd., Whyteleafe, Surrey, England.
Kent, Roscoe	Box 548, Newark, N. J.
Kirkwood, Loren R.	606 Maple Ave., Merchantville, N. J.
Knoble, Edward F.	200 White Horse Pike, West Collingswood, N. J.
Knubbe, Harold H.	3500 Bedford Rd., Detroit, Mich.
Kuzela, Edward V.	Bell Telephone Laboratories, Inc., 180 Varick St., New York, N. Y
Lane, Howard D.	2425-17th St., San Francisco, Calif.
Leslie, Fred D.	12 Rue Blanche, Paris, France.
Leutz, Charles R.	112 North Ave., West, Cranford, N. J.
Likel, Harry C.	207 Park Pl., Brooklyn, N. Y.
Loukota, Douglas H.	1967½ N. Wilcox Ave., Los Angeles, Calif.
Lucas, Earle F.	68 Prospect Ave., Irvington, N. J.
Lyle, A. Ernest	61-17 Woodside Ave., Long Island, N. Y.
Malmstedt, Charles H.	93 Perry Street, Apt. 14, New York, N. Y
Markillie, Royal G.	698 Greenwood St., S.W., Atlanta, Ga.
Marsden, Bernard	101 East Edsall Ave., Palisades Park, N. J.
Martin, J. Laurance	140 Wayside Dr., Amarillo, Tex.
Matthews, A. C.	Cape May, N. J.
Morey, W. J.	825 Portsmouth, Westchester, Ill.
Neilson, Neil S.	234 W. Witherbee, Flint, Mich.
Nelson, Fitz J.	Lock Box 574, Lansing, Mich.
Noe, Milford W.	1247 Ingraham St., Apt. 310, Los Angeles, Calif.
O'Brien, Daniel L.	6440 Regent St., Oakland, Calif.
Oliver, George E.	82 State St., Brooklyn, N. Y.
Owens, William B.	652 W. Peachtree St., Atlanta, Ga.
Pecorini, Robert R.	Oakwood, Baddlesmere Rd., Tankerton, Kent. England.
Percy, Faye W.	Box 4475, University of Arizona Station, Tucson, Ariz.
Peterson, Donald W.	432 Haddon Ave., Camden, N. J.
Powell, Albert E.	Southern Radio Corpration, Cassilla 669, La Paz, Bolivia, South America
Price, Harold W.	474 Palmerston Blvd., Toronto, Ont., Canada.
Rainwater, Brown V.	794 Springdale Rd., N.E., Atlanta, Ga.
Reifel, Harry	140 Norwood St., Newark, N. J.
Renke, Adolph	45 Horatio St., New York, N. Y.
Reuman, Wm. H.	4130 58th St., Woodside, L. I., N. Y.
Reynolds, W. W.	4408 Harrison St., N.W., Washington, D. C.
Rosso, Thomas	U. S. Coast Guard, Rockefeller Bldg., Cleveland, Ohio.
Russell, Herbert J.	25 Nevis Road, Balham, London, S.W., England.
Rowe, Victor G.	625 West 108th St., Los Angeles, Calif.
Schaefer, Richard J.	2476 Waverly Ave., Detroit, Mich.
Schlieder, Harold A.	313 N. Clinton St., Cathage, N. Y.
Schott, Oscar A.	1717 Portland Ave., South Minneapolis, Minn.
Scofield, Robert W.	40-22 Lawrence St., Flushing, L. I., N. Y.
Singleton, George E.	11, Rosegrove Lane, Rose Grove, Nr. Burnley, Lancashire, England.
Smack, John C.	10 E. 40th St., New York, N. Y.
Smith, Jerome C.	4618 Lafayette Ave., Merchantville, N. J.
Snyder, Roy A.	5523 S. Adams St., Peoria, Ill.
Sorensen, Carl P.	3705 Byron St., Chicago, Ill.
Stewart, Welby E.	2324 Knapp St., Ames, Iowa.
Stoker, Warren C.	1834 Highland Ave., Troy, N. Y.
Strohl, Wellington M.	Bell Telephone Laboratories, Box 107, Red Bank, N. J.
Swank, Wallace B.	4251 Irving Park Blvd., Chicago, Ill.
Swanson, Merrill J.	Radio Station WRAK, Williamsport, Pa.
Taber, Ira D.	25 Pearl Street, New Hartford, N. Y.
Taylor, J. L.	179 Mapleview Drive, Tonawanda, N. Y.
Thompson, Reginald H.	5 Loreburn Rd., Wavertree, Liverpool, England.
Tickus, Louis J.	3001 St. Jean Ave., Detroit, Mich.
Ting, Chester Y.	127 Mt. Auburn St., Cambridge, Mass.
Tingey, Robert	45 Nevern Sq., Earl's Court, S.W. 5, England.
Tomchuck, John	4866 Londo Rd., Detroit, Mich.
Toth, E.	233 Littleton Ave., Newark, N. J.
Treitel, Leo	1 Seaman Ave., New York, N. Y.
Tumleson, James E.	4 South Portland Ave., Brooklyn, N. Y.
Valentine, Russell D.	6848 Ingram St., Forest Hills, N. Y.
Van Duyne, Eugene D.	41 Waldo Ave., East Rockaway, L. I., N. Y.
Weagant, Roy A.	101 Forest Rd., Douglas Manor, L. I., N. Y.
Weeden, William N.	1 Alden Pl., Bronxville, N. Y.
Wendler, Edward A.	c/o District Manager, Bureau of Air Commerce, Air Navigation Division, Municipal Airport, Newark, N. J.
Wiebach, William T.	207 Avenue C., Rochester, N. Y.
Williams, Aaron F.	RCA Victor Co., Inc., Bldg. 6, Camden, N. J.

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New RCA speech input equipment offers broadcasters greater performance

GREATER DEPENDABILITY and other fine features stamp this equipment as outstanding. *Proofs* of RCA's superiority that mean more dependable and better station performance for you.

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Extremly Modern Meter Panel 15-C ...Has new streamlined meter cases with illuminated dials. D. C. Volt Meter, 0-250 Volts. Milliammeter, 0-10 M.A. A.C. Line Volt Meter, 0-150 Volts.

Advance Designed Pre-Amplifier, Type 41-C . . . Panel door in front opens to provide quick and easy access to all tubes. Has hinged chassis construction and easy accessibility to wiring and component parts.

Program Amplifier Type 40-D . . . With new "peak reading" volume indicator and illuminated volume indicator meter. An improvement over popular RCA Type 40-C, having better accessibility, more ventilation, increased volume indicator range and push keys for instant individual tube metering.

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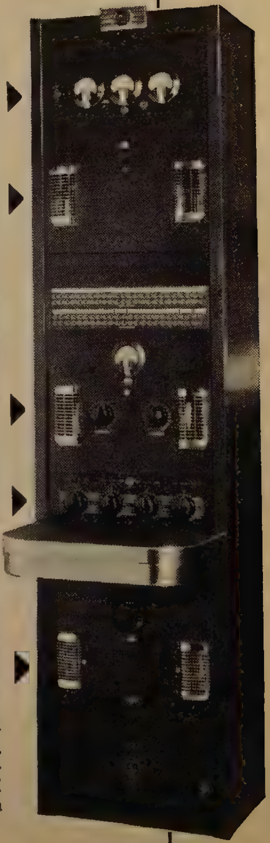

The Institute of Radio Engineers

Incorporated

330 West 42nd Street, New York, N.Y.

APPLICATION FOR ASSOCIATE MEMBERSHIP

(Application forms for other grades of membership are obtainable from the Institute)

To the Board of Directors

Gentlemen:

I hereby make application for Associate membership in the Institute of Radio Engineers on the basis of my training and professional experience given herewith, and refer to the members named below who are personally familiar with my work.

I certify that the statements made in the record of my training and professional experience are correct, and agree if elected, that I will be governed by the constitution of the Institute as long as I continue a member. Furthermore I agree to promote the objects of the Institute so far as shall be in my power, and if my membership shall be discontinued will return my membership badge.

______________________ (Sign with pen)

______________________ (Address for mail)

______________________ (Date) ______________________ (City and State)

Sponsors:

(Signature of references not required here)

Mr. ______________________ Mr. ______________________

Address ______________________ Address ______________________

City and State ______________________ City and State ______________________

Mr. ______________________

Address ______________________

City and State ______________________

The following extracts from the Constitution govern applications for admission to the Institute in the Associate grade:

ARTICLE II—MEMBERSHIP

Sec. 1: * * * (c) Associates, who shall be entitled to all the rights and privileges of the Institute except the right to hold any elective office specified in Article V. * * *

Sec. 4: An Associate shall be not less than twenty-one years of age and shall be a person who is interested in and connected with the study or application of radio science or the radio arts.

ARTICLE III—ADMISSION AND EXPULSIONS

Sec. 2: * * * Applicants shall give references to members of the Institute as follows: * * * for the grade of Associate, to three Fellows, Members, or Associates; * * * Each application for admission * * * shall embody a full record of the general technical education of the applicant and of his professional career.

ARTICLE IV—ENTRANCE FEE AND DUES

Sec. 1: * * * Entrance fee for the Associate grade of membership is $3.00 and annual dues are $6.00.

ENTRANCE FEE SHOULD ACCOMPANY APPLICATION

(Typewriting preferred in filling in this form) No. ....

RECORD OF TRAINING AND PROFESSIONAL EXPERIENCE

Name ....
(Give full name, last name first)

Present Occupation ....
(Title and name of concern)

Business Address ....

Permanent Home Address ....

Place of Birth ....Date of Birth ....Age ......

Education ....

Degree ....
(College) (Date received)

TRAINING AND PROFESSIONAL EXPERIENCE

DATES	

Record may be continued on other sheets of this size if space is insufficient.

Receipt Acknowledged ....Elected ....Deferred............

Grade ....Advised of Election ....This Record Filed...........

TRIPLETT

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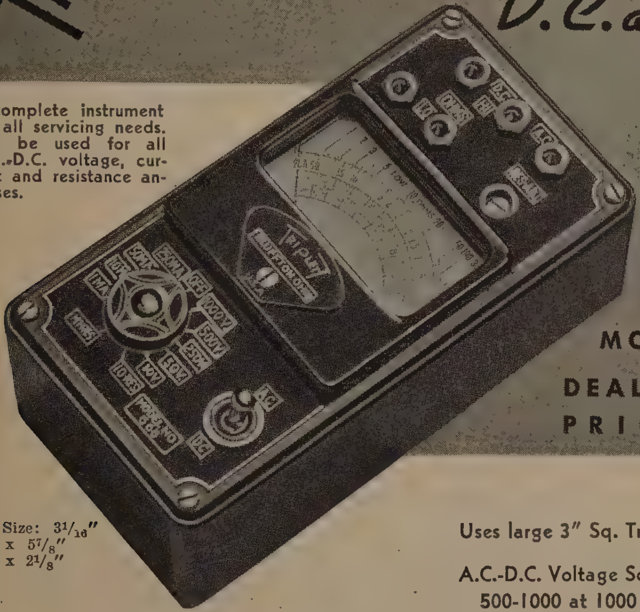
A complete instrument for all servicing needs. Can be used for all A.C.-D.C. voltage, current and resistance analyses.



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DEALER PRICE $15.00

Size: $3^1/_{16}$″ x $5^7/_8$″ x $2^1/_8$″

Uses large 3″ Sq. Triplett Instrument

A.C.-D.C. Voltage Scales Read: 10-50-250-500-1000 at 1000 ohms per volt.

D.C. Milliampere Scale Reads: 1-10-50-250.

Ohm Scale Reads: Low 1/2-300, high 250,000.

Black Molded Case and Panel

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Complete with Alligator Clips, Battery and Test Leads.

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Model 669, supplied extra.

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——More information on Model 666.
——I am also interested in______________
Name______________________________
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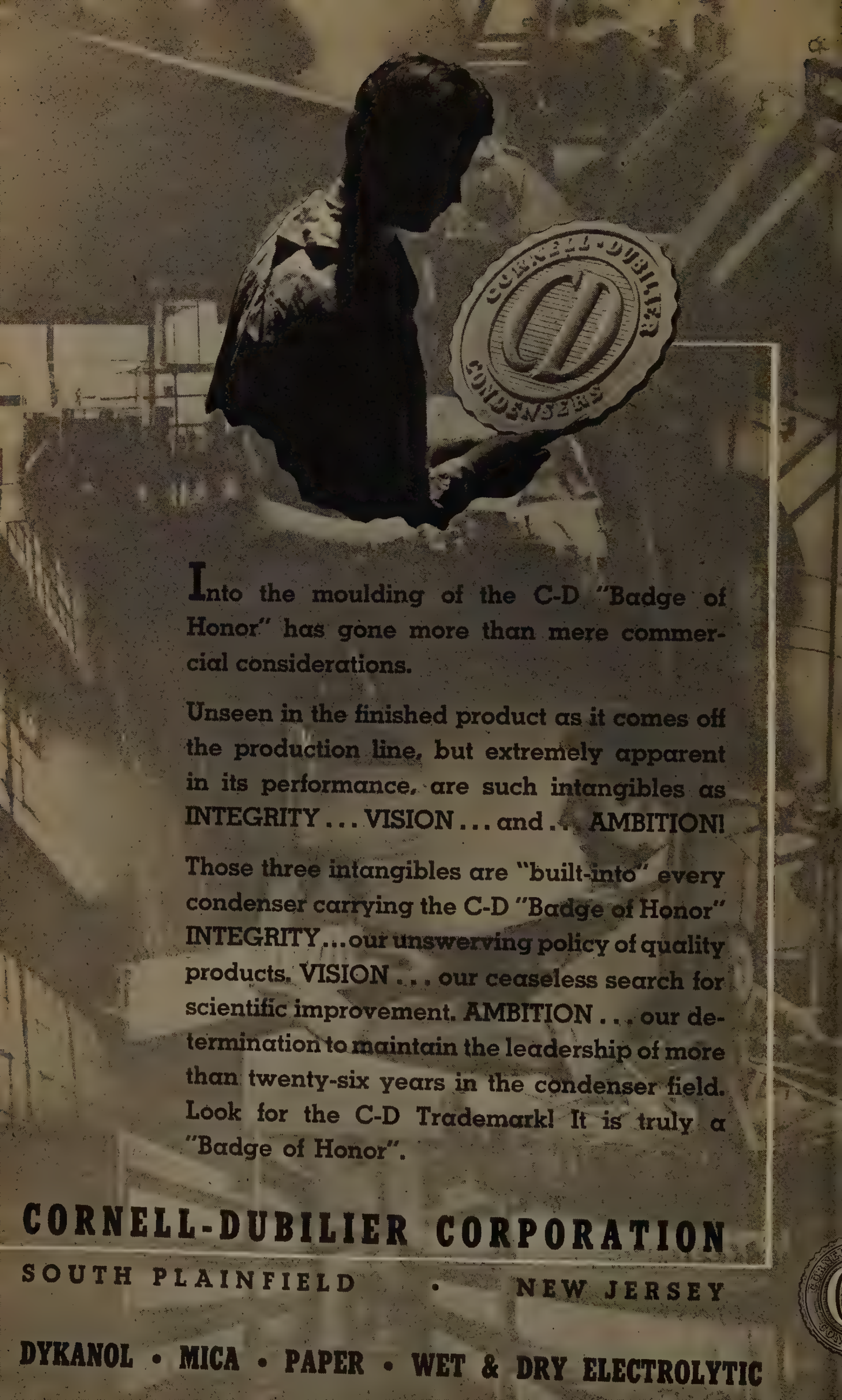

Into the moulding of the C-D "Badge of Honor" has gone more than mere commercial considerations.

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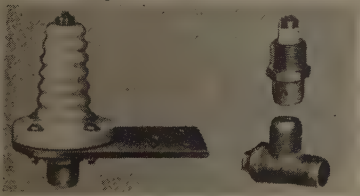
FROM
TRANSMITTER
TO *Antenna*
A Complete Installation with
ISOLANTITE COAXIAL
TRANSMISSION LINE

WESTERN ELECTRIC ultra high frequency Police Radio Transmitter. Station W2XEM. Newark, N. J.



National Newark and Essex Bank Building. Showing location of transmitter and antenna connected by ISOLANTITE COAXIAL TRANSMISSION LINE.

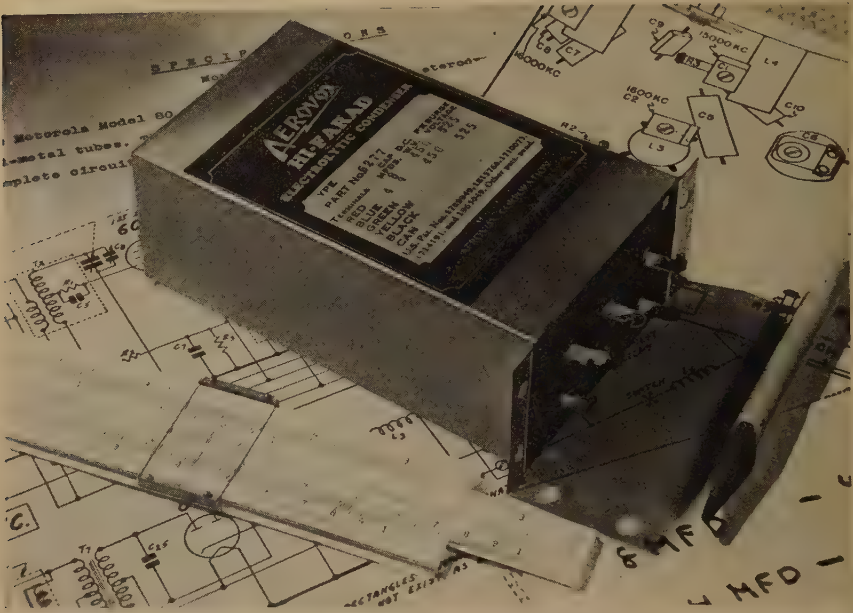
In the rapidly developing technique of radio communication engineers recognize the coaxial transmission line as the most efficient means of conducting radio frequency energy from point to point and from transmitter to antenna.

ISOLANTITE INC. has been closely identified with this development and now announces A COMPLETE COAXIAL TRANSMISSION LINE SYSTEM for ultra high frequency and broadcasting stations.

Write for our complete bulletin on this product. ISOLANTITE INC., 233 Broadway, N. Y. C. Factory at Belleville, N. J.

Sold only through Graybar Electric Company and Manufacturers of transmitting equipment

Isolantite
CERAMIC INSULATORS



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plus

CORRECT-APPLICATION ENGINEERING

Dry electrolytics . . . metal-can, cardboard case, tubulars.

★

Paper condensers . . . metal-case, cartridge, oil-filled, uncased.

★

Widest assortment of molded mica units.

★

Auto radio condensers and noise suppressors.

★

Also a line of wire-wound and carbon resistors.

UNLIKE other features of set design, the power pack receives little attention. It is usually the last thing considered. Its performance is taken for granted.

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Consult Us regarding those condenser problems. Our engineers will gladly cooperate in providing condensers fitted to your exact requirements. A background experience second to none is yours for the asking.

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who can handle a little extra business this year

For the Designer
who can manage some additional work

we suggest the Engineering Directory of the I.R.E. PROCEEDINGS. Manufacturers who need services such as yours and organizations with special problems come to our Engineering Directory for information. Your name and special service announced here will put you in line for their business. For further information and special rates for I.R.E. members write to the Institute of Radio Engineers.

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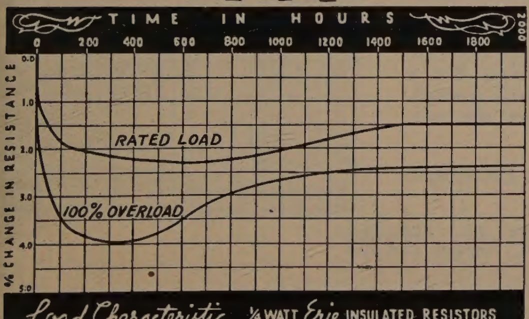
PROCEEDINGS BOUND VOLUMES

* * *

VOLUME 23 (1935) of the Proceedings is now available in bound form to members of the Institute. It may be obtained in Buckram or Morocco leather for $9.50 and $12.00 respectively. Foreign postage is $1.00 additional per volume.

Buckram bound copies of Volumes 18 and 19 (1930 and 1931) are also available for $9.50. Foreign postage is $1.00 additional per volume.



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The efficiency of Erie Insulated Resistors is not impaired by their small size. As the chart at the left shows, Erie 1/4" x 7/16" Insulated Units will safely carry a 100% overload with but a small change in resistance value. Not only is the maximum change less than 4.0%, but recovery occurs quickly and the resistance value is stabilized around 2.4% after approximately 1400 hours.

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It pays to use dependable Erie Insulated Resistors.

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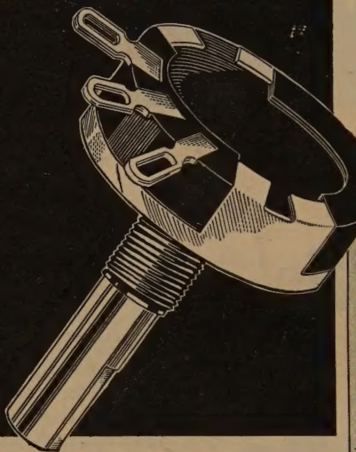
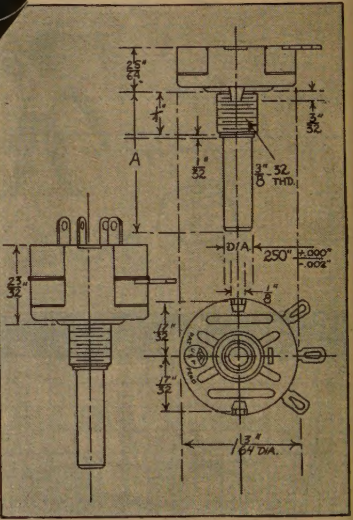
Truly THE ONLY MIDGET CONTROL WITH A LONG RESISTANCE PATH



Total rotation 330°. Rotation to throw switch 35° controls also available with fixed resistance minimum. Total rotation then 280°. May be had with 1, 2, or 3 taps.

Switch data: S.P.S.T., D.P.S.T. S.P.D.T. four point. S.P.S.T. switches also available with dead lug. S.P.S.T. switch rating: 3 amps 125 volts; lamp 250 volts; 10 amps 12 volts.



The new radio chassis designs, particularly auto sets, concentrate on small control sizes because of convenience in layout.

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For satisfactory silent service, specify CENTRALAB.

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